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WHAT IS CLAIMED IS:

- 1. A microporous biodegradable polymeric article comprising an essentially continuous porosity with a void volume from 10 to 90%, wherein pore diameters show a unimodal distribution set to a predefined unimodal peak location corresponding to a chosen pore diameter, and wherein a majority of pores has a diameter within ± 50% of the chosen pore diameter.
- The microporous biodegradable polymeric article according to claim 1, wherein the predefined unimodal peak location corresponds to a chosen pore diameter selected from 20 nm to 500 µm.
 - 3. The microporous biodegradable polymeric article according to claim 2, wherein the predefined unimodal peak location corresponds to a chosen pore diameter selected from 1 to 72 μm .
- The microporous biodegradable polymeric article according to claim 3,
 wherein the majority of pores has a diameter within ± 40% of the chosen pore diameter.
 - 5. The microporous biodegradable polymeric article according to claim 1, wherein the predefined unimodal peak location corresponds to a chosen pore diameter selected from 1 to 3 μ m, and wherein the majority of pores has a diameter within \pm 25% of the chosen pore diameter.
 - 6. The microporous biodegradable polymeric article according to claim 1, wherein the porosity is fully continuous.
 - 7. The microporous biodegradable polymeric article according to claim 1, wherein the article has a symmetric morphology.
- 25 8. The microporous biodegradable polymeric article according to claim 1, wherein the article has an asymmetric morphology.

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- 9. The microporous biodegradable polymeric article according to claim 8, wherein the article has a closed-cell skin.
- 10. The microporous biodegradable polymeric article according to claim 1, wherein at least 95% of said article is made of a biodegradable medical polymer selected from the group consisting of poly(lactic acid), poly(glycolic acid), poly(lactic-co-glycolic), polyorthoesters, polycaprolactones, polyanhydrides and their copolymers.
- 11. The microporous biodegradable polymeric article according to claim 1, wherein at least 99% of said article is made of a biodegradable medical polymer selected from the group consisting of poly(lactic acid), poly(glycolic acid), poly(lactic-co-glycolic), polyorthoesters, polycaprolactones, polyanhydrides and their copolymers.
 - 12. The microporous biodegradable polymeric article according to claim 1, wherein said article is essentially made of a biocompatible, implantable polymer.
 - 13. A microporous biodegradable polymeric article comprising an essentially continuous porosity with a void volume from 10 to 90%, wherein pore diameters show a unimodal distribution set at a predefined unimodal peak location corresponding to a chosen pore diameter, and wherein a majority of pores has a diameter within ± 50% of the chosen pore diameter, prepared according to a method comprising the steps:
 - a) selecting at least one biodegradable polymer A, one polymer B, biodegradable or not, at least partially immiscible with A, and a polymeric compatibilizer C for A and B;
- b) melt blending the selected polymers from step a) and the compatibilizer C, thereby preparing a compatibilized polymer

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blend, wherein said polymers A and B have an essentially continuous morphology;

- cooling said polymer blend to room temperature, thereby retaining its morphology; and
- d) extracting said polymer B and said compatibilizer C, at least partially, from the polymer blend by dissolving them in a solvent that is a non-solvent of polymer A.
 - 14. A method of preparation of a microporous biodegradable polymeric article, comprising the steps:
- a) selecting at least one biodegradable polymer A, one polymer B, biodegradable or not, at least partially immiscible with A, and a polymeric compatibilizer C for A and B;
 - b) melt blending the selected polymers from step a) and the compatibilizer C, thereby preparing a compatibilized polymer blend, wherein said polymers A and B have an essentially continuous morphology;
 - c) cooling said polymer blend to room temperature, thereby retaining its morphology; and
- d) extracting said polymer B and said compatibilizer C, at least partially, from the polymer blend by dissolving them in a solvent that is a non-solvent of polymer A,

wherein said polymeric article has an essentially continuous porosity with a void volume from 10 to 90%, wherein pore diameters show a unimodal distribution set to a predefined unimodal peak location corresponding to a chosen pore diameter, and wherein a majority of pore has a diameter within \pm 50% of the chosen pore diameter.

- 15. The method according to claim 14, wherein said polymer A is a biodegradable medical polymer.
- 16. The method according to claim 15, wherein said polymer A is an aliphatic polyester.
- The method according to claim 15, wherein said polymer A is selected from the group consisting of poly(lactic acid), poly(glycolic acid), poly(lactic-co-glycolic), poly(hydroxyalkanoates), polyorthoesters, polycaprolactones, polydioxanone, polyanhydrides and their copolymers.
- 18. The method according to claim 14, wherein said polymer B is a non-biodegradable polymer.
 - 19. The method according to claim 14, wherein said polymer B is a biodegradable medical polymer.
- The method according to claim 19, wherein said polymer B is selected from a group consisting of poly(lactic acid), poly(glycolic acid), poly(lactic-co-glycolic), poly(hydroxyalkanoates), polyorthoesters, polycaprolactones, polyanhydrides and their copolymers.
 - 21. The method according to claim 14, wherein said compatibilizer C is a polymeric compatibilizer.
- 22. The method according to claim 21, wherein said compatibilizer C is a copolymer of A and B.
 - 23. The method according to claim 14, wherein said polymers A and B are fully immiscible.
 - 24. The method according to claim 14, wherein said polymer blend is co-continuous at more than 90%.

- 25. The method according to claim 14, wherein said polymer blend may contain one or more additives.
- 26. The method according to claim 14, wherein said polymer blend is submitted to a further step of controlled annealing between steps b) and c), thereby increasing the pore size of the porous article.
- 27. The method according to claim 14, wherein said polymer blend is submitted to controlled cooling rates in step c).
- 28. The method according to claim 14, wherein said polymer blend is further shaped into a geometrical form between steps b) and c).
- 10 29. The method according to claim 28, wherein said polymer blend is further shaped in a mold or die, between steps b) and c).
 - 30. The method according to claim 28, wherein said polymer blend is shaped by injection molding, between steps b) and c).
- The method according to claim 28, wherein said polymer blend is formed by extrusion, between steps b) and c).
 - 32. The method according to claim 28, wherein said polymer blend is formed by melt spinning between steps b) and c).
- The method according to claim 14, wherein said polymer blend is submitted to a mechanical stress that orients the porosity in at least one specific direction, between steps b) and c).
 - 34. The method according to claim 14, wherein said polymer blend is submitted to a mechanical stress that orients the porosity in at least one specific direction, during step c).

- 35. The method according to claim 14, wherein said polymeric article is further submitted to a controlled immersion in a solvent for its polymer A after step d), thereby creating a closed-cell skin.
- The method according to claim 14, wherein said polymer blend is further submitted to a controlled immersion in a common solvent for A and B between steps c) and d), thereby creating an asymmetric open-cell morphology in the porous article.
 - 37. The use of a microporous biodegradable article according to any of claims 1-13 in tissue engineering.
- 10 38. The use of a microporous biodegradable article obtained by the method according to any of claims 14-36 in tissue engineering.
 - 39. The use of a microporous biodegradable article according to any of claims 1-13 as a substrate for controlled release applications.
- The use of a microporous biodegradable article obtained by the method according to any of claims 14-36 as a substrate for controlled release applications.
 - 41. The use of a microporous biodegradable article according to any of claims 1-13 as an implantable medical device.
- The use of a microporous biodegradable article obtained by the method according to any of claims 14-36 as an implantable medical device.